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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/642,183	08/17/2000	Ramon Alfredo Carvalho Siochi	00 P 7825 US	6407

7590 10/25/2002

Siemens Corporation  
Intellectual Property Department  
186 Wood Avenue South  
Iselin, NJ 08830

EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 10/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/642,183

Applicant(s)

SIOCHI, RAMON ALFREDO  
CARVALHO

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 7-9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

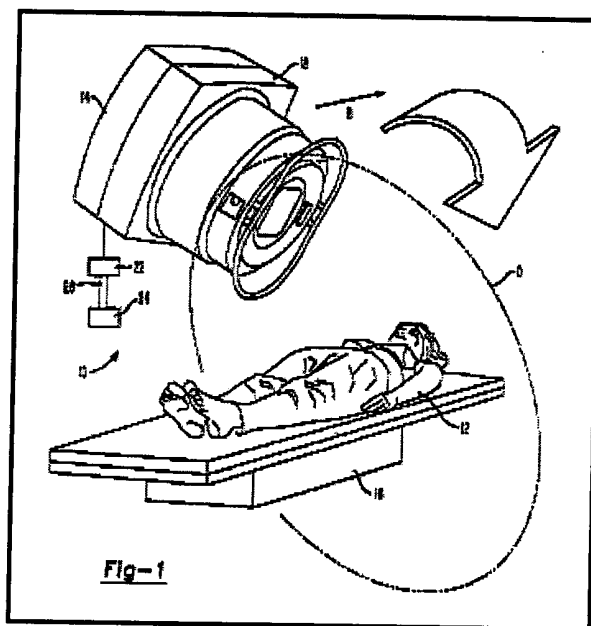
# DETAILED ACTION

## *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 5, 6 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu (U.S. Patent 5,818, 902).



3.

Figure 1 - U.S. Patent 5,818,902 to Yu

4. As per claims 1, 2, 5, 6 and 10-12, Yu discloses a method (and system) comprising the step of positioning a multi-leaf collimator between a radiation source and a treatment area to block the radiation to define a first treatment field, the collimator being positioned with leaves of the collimator extending longitudinally in a first direction (i.e. Fig. 1a) and moving the multi-leaf

collimator through a first arc over the treatment area while delivering radiation through the first treatment field to the treatment area (Fig. 1, column 14, lines 35-67).

5. Yu does not explicitly disclose a method comprising the steps a) rotating the multi-leaf collimator about a central axis such that the leaves define a second treatment field and moving the multi-leaf collimator through a second arc over the treatment area while delivering radiation through the second treatment field to the treatment area b) wherein moving the multi-leaf collimator through a first and second arc comprises moving the collimator from a first position to a second position and moving the multi-leaf collimator through a second arc comprises rotating the collimator from the second position to the first position c) moving the leaves longitudinally after moving the multi-leaf collimator through the first arc to define a third treatment area and moving the multi-leaf collimator back through the first arc in an opposite direction while delivering radiation through the third treatment field d) wherein moving the leaves comprises moving the opposing pairs of leaves away from each other e) wherein rotating the multi-leaf collimator comprises rotating the collimator until leaves extend longitudinally in a second direction generally orthogonal to the first direction and f) wherein delivering radiation through the first treatment field comprises delivering one half of a prescribed radiation dose and delivering radiation to a second treatment field comprises delivering a remaining half of the prescribed radiation dose.

6. Yu does disclose however, the changing of treatment field shapes for optimum delivery of radiation to treatment sites and the delivery of radiation over multiple arcs through altered treatment fields (abstract, Fig. 1, 1a; column 1, lines 23-67, column 2, lines 1-67, column 3, lines 1-4; column 14, lines 35-67). Though silent as to the combinations available for the changing of

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treatment fields (i.e. column 6, lines 28-43), Yu teaches that the changing of treatment fields allows the irradiation of an irregularly shaped, three dimensional tumor or the like, thereby limiting radiation exposure to the surrounding healthy tissue (abstract – see also column 2, lines 66-67, column 3, lines 1-4). Additionally, Yu teaches that radiation delivery can be optimized based on factors such as treatment field configuration and irradiation angle as well as anatomical and biological constraints (column 5, lines 60-67, column 6, lines 1-7).

7. It would have been obvious to modify the method (and system) of Yu such that it incorporated the steps a-f (above). One would have been motivated to make such a modification so that radiation is optimized for delivery to an irregularly shaped tumor or the like, while reducing radiation exposure to the surrounding healthy tissue as taught by Yu (abstract, Figs. 1, 1a; column 1, lines 23-67, column 2, lines 1-67, column 3, lines 1-4; column 14, lines 35-67).

8. As per claims 3 and 4, Yu discloses a method wherein the first arc has the same geometry as the second arc and wherein the first arc has the same starting and ending points (i.e. Fig. 1; column 14, lines 35-67).

*Allowable Subject Matter*

9. Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. As per claim 7 and dependent claims 8 and 9, the examiner found no reference in the prior art that disclosed or made obvious a method comprising the step of dividing a treatment area into a plurality of cells, each having a defined treatment intensity level; grouping the cells to form a plurality of matrices, each of the matrices having at least one dimension approximately

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equal to a width of the collimator leaf and decomposing each of the matrices into orthogonal matrices.

*Conclusion*


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305 3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

October 14, 2002

  
ROBERT H. KIM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800